

EFFECTS OF PREFERENCE ON VERIFICATION OF DISCRIMINATED MANDS

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Previous research suggests that motivating operation (MO) manipulations may assist in assessing discriminated manding (Gutierrez et al., 2007). The current study partially replicated and extended previous research by varying access to concurrently available reinforcers with different preference values (i.e., MO manipulations). Manding did not occur (a) for reinforcers that were freely available and (b) for lower preference items when relatively higher preference reinforcers were freely available. Results further demonstrated the utility of manipulating MOs to verify discriminated mands but suggest that relative preference of alternative reinforcers should be controlled during these assessments.

Key words: motivating operations, functional communication training, discriminated manding, preference

Communication systems that involve picture cards are often used to help individuals with intellectual disabilities and vocal communication deficits make requests (e.g., Bondy & Frost, 2001). Effective use of these systems requires emission of discriminated mands. That is, responses must be under joint control of the relevant motivating operations (MOs) and the discriminative stimulus properties of the cards (e.g., picture icons). Responses that are under joint control should be more likely to occur in the presence of both an MO and a stimulus condition correlated with the availability of reinforcement. Responses to access a reinforcer that is already present (establishing operation [EO]-absent condition) may indicate that other variables are influencing the behavior, indicating that the response may not be a mand. Gutierrez et al. (2007) extended the literature on communication systems by systematically manipulating the MO for similarly preferred reinforcers (by either making those reinforcers

freely available or absent) to verify whether a response was a discriminated mand. Results indicated that three of the four participants acquired discriminated mands during mand training. We systematically replicated Gutierrez et al. by assessing stimuli of dissimilar rather than similar preference, which allowed an analysis of the interactive effects of varied preference level and MO manipulation.

METHOD

Participant and Setting

Luke was an 8-year-old boy who had been diagnosed with Cornelia de Lange Syndrome, microcephaly, severe intellectual disabilities, hypothyroidism, and attention deficit hyperactivity disorder. He had been admitted to an inpatient neurobehavioral unit for the assessment and treatment of severe problem behavior. All sessions were conducted in a padded treatment room (3 m by 3 m) with a one-way mirror.

Data Collection and Interobserver Agreement

Trained observers recorded all targeted responses using paper-and-pencil data collection. Selection of the low-preference (LP) card was recorded during the MO manipulation

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phase (see below) if Luke touched the card depicting the LP reinforcer with his hand without any prompting from the therapist. Selections of the medium-preference (MP), high-preference (HP), and a no-reinforcement control card were recorded in a similar manner. Each laminated card measured approximately 12 cm by 12 cm and included a digital photograph of a reinforcer (HP, MP, or LP). The no-reinforcement control card was identical to the other cards with the exception of a black dot approximately 5 cm in diameter in lieu of a picture of a stimulus from the preference assessment. No response was recorded if Luke did not touch any of the cards within 1 min of their presentation.

Interobserver agreement was collected on 49% of sessions across the entire MO manipulation. Agreement was calculated on a trial-by-trial basis for each session by dividing the total number of agreements across trials by the sum of the number of agreements and disagreements and multiplying by 100%. Agreement was 100% across all types of cards and all sessions.

Preassessment Procedure

Results of a functional analysis suggested that Luke's problem behavior was maintained by access to tangible reinforcers. Functional communication training (FCT; Carr & Durand, 1985) was initiated to replace problem behavior with a communication card response to access tangible reinforcers (i.e., access to a bin that contained HP, MP, and LP toys). Results of a paired-stimulus preference assessment (Fisher et al., 1992) identified the HP, MP, and LP toys. Mand training was conducted to teach Luke to discriminate the consequences arranged for the three different cards, each corresponding to a specific reinforcer (i.e., HP, MP, or LP), from a control card. Training was conducted using the target card and a no-reinforcement control card. Training was completed separately for each card. For 5 min prior to each session, the therapist restricted Luke's access to all toys or other preferred items. Following the 5-min

deprivation period, the therapist provided Luke with 30 s of access to the target reinforcer prior to the start of a session. At the beginning of session, the therapist removed the reinforcer. The card depicting that reinforcer and the control card were presented simultaneously. Training sessions consisted of five trials. A trial began when the therapist presented cards in front of Luke and ended when Luke selected a card independently or following a prompt. If he did not select either card within 10 s of their presentation, the therapist implemented a least-to-most prompting procedure to guide selection of the card that corresponded to the reinforcer. If Luke selected the corresponding card (independently or following a prompt at any level), the cards were removed and the therapist provided Luke with 30-s access to the reinforcer. Following 30 s of reinforcement, the therapist removed the item and presented the cards. If Luke selected the control card, the therapist removed the cards for 30 s (no reinforcer was delivered) and then re-presented the cards for the next trial. Training was completed when Luke independently (i.e., no prompts given) selected the card that depicted the reinforcer on at least 80% of trials for two consecutive five-trial sessions.

MO Manipulation

The MO manipulation was conducted after mand training to determine if the card-selection responses were under joint control of the relevant MOs and stimulus properties of each card (i.e., discriminated mands). Three separate analyses were conducted such that each reinforcer was paired with the other reinforcers in the following order: HP versus LP, MP versus LP, HP versus MP. Across all analyses, the therapist implemented a deprivation period prior to the start of each session, as in the mand training procedure. Following the deprivation period, the therapist provided Luke with access to the target reinforcers for 30 s. At the beginning of the session, the therapist removed the reinforcers and simultaneously presented the

cards that depicted the target reinforcers and the control card. Sessions consisted of five trials. A trial began when the therapist presented cards in front of Luke and ended when Luke selected a card independently (i.e., no prompts given) or 1 min elapsed without a card selection.

Each analysis began with a baseline phase. In the baseline phase, the therapist presented three cards simultaneously (a control card and two cards that corresponded to the reinforcers under comparison). The therapist delivered the associated consequence contingent on a card selection. Under this concurrent-schedule arrangement, the selection of the control card produced the removal of the cards but no other consequences for 30 s (i.e., no access to any reinforcer for 30 s), and each of the other two cards produced 30-s access to its corresponding reinforcer on a fixed-ratio 1 schedule. During all conditions, all cards were removed after any selection to prevent more than one selection per trial. The purpose of the baseline phase was to verify the relative preference of the reinforcers under comparison.

After baseline in each analysis, various response-independent access conditions were conducted (see below) in which the therapist provided one reinforcer on a response-independent basis. The reinforcer that was provided independently of responding was alternated in a withdrawal design. Each analysis concluded with a condition in which the therapist made only the LP and control cards available. This condition was conducted to assess whether Luke would request the LP reinforcer when the option to request HP and MP reinforcers was not available.

HP versus LP analysis. All procedures were similar to those in baseline except that the therapist provided continuous response-independent access to the HP reinforcer at the beginning of each trial. If Luke selected the HP card, he maintained access to that reinforcer for 30 s. Response-independent access to the HP and LP items alternated in subsequent phases, and the analysis concluded with the LP versus control phase.

MP versus LP analysis. This analysis was identical to the HP versus LP analysis, except that an MP reinforcer was used instead of an HP reinforcer.

HP versus MP analysis. Procedures were identical to those in the HP versus LP analysis with the exception of the design. Baseline phases were alternated with conditions in which either the HP or MP reinforcer was provided independently of responding (i.e., a multielement design). This design was used to expedite the final comparison and was necessary due to clinical time constraints.

RESULTS AND DISCUSSION

Results for the comparison of the HP and LP reinforcers are depicted in Figure 1 (top). During baseline, Luke typically selected the card that corresponded to the HP reinforcer, verifying the relative preference rankings of HP and LP reinforcers. In the majority of the trials in which he had response-independent access to the HP reinforcer, he did not select any card. When Luke had response-independent access to the LP reinforcer, he frequently selected the card that produced the HP reinforcer and rarely selected the card that produced the LP reinforcer. He typically selected the LP card in the final condition when only the LP card and the control card were presented. Results for the comparison of the MP and the LP reinforcers are depicted in Figure 1 (middle). Luke's response patterns were similar to those in the previous analysis. He selected the card that produced the MP reinforcer frequently and rarely selected the card that produced the LP reinforcer when he had response-independent access to the LP reinforcer. He did not select any card when he had response-independent access to the MP reinforcer. Results for the comparison of the HP and the MP reinforcers are depicted in Figure 1 (bottom). Response patterns were similar to those in the previous two analyses, in that Luke selected the card that produced the HP reinforcer when he had

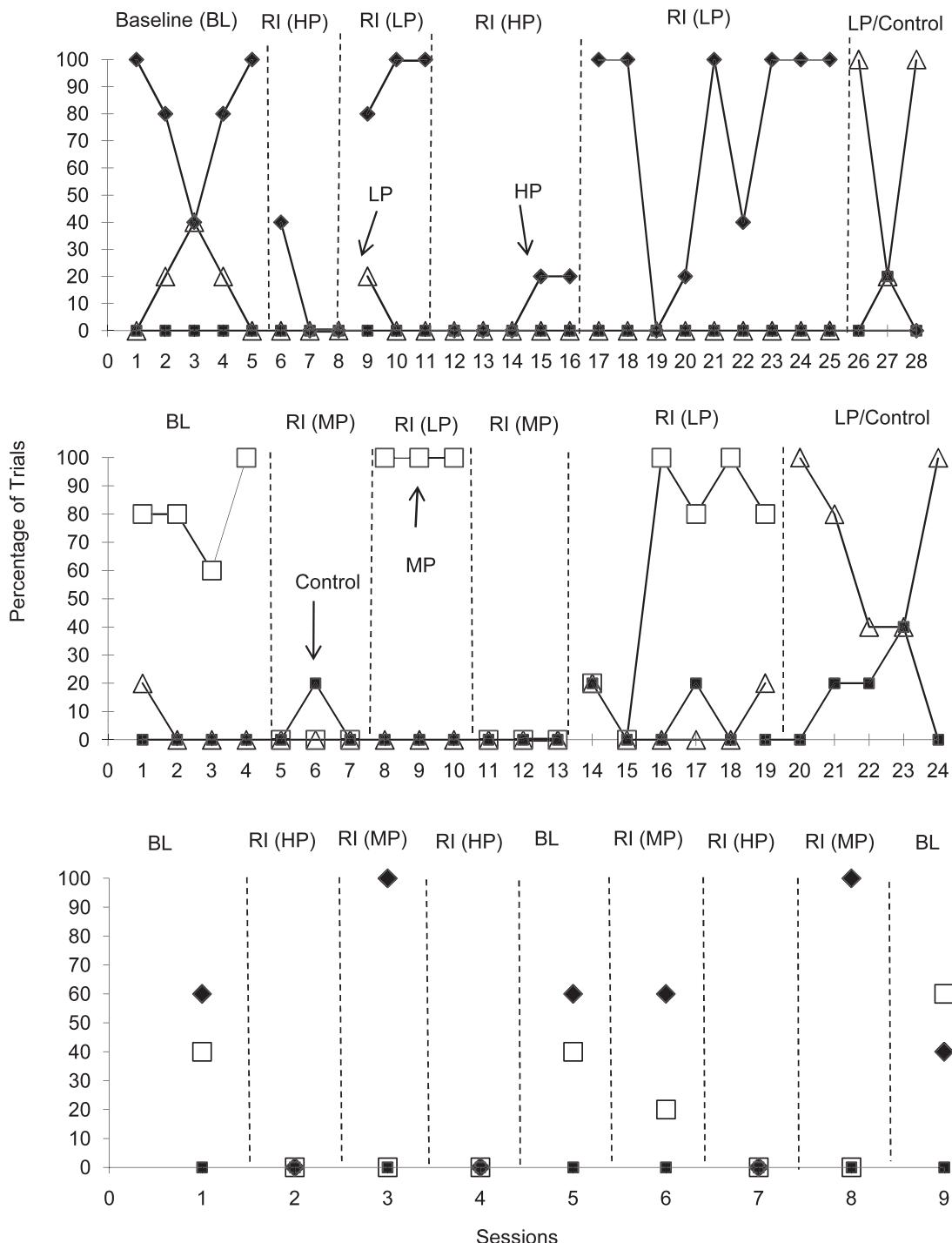


Figure 1. Results of Luke's MO manipulation showing the percentage of response allocation of mands across low-, medium-, and high-preference stimuli. The top panel depicts the comparison between high-preference (HP) and low-preference (LP) reinforcers. The middle panel depicts the comparison between the medium-preference (MP) and the LP reinforcers. The bottom panel depicts the comparison between the HP and MP reinforcers. RI = response-independent access to an item of specified preference level.

response-independent access to the MP reinforcer but did not select any card when he had response-independent access to the HP reinforcer.

These results further demonstrate that an MO manipulation can be used to verify the establishment of discriminated mands. Results also demonstrated that the relative preference of alternative reinforcers can affect results of MO manipulations. Similar to Gutierrez et al. (2007), these findings confirmed that selections of the higher preference cards were discriminated mands because the response typically occurred only when the relevant establishing operation (EO) was present, and Luke rarely selected the control card. However, he did not select the card for the less preferred reinforcers when the EO was present in all situations. He selected the card for the less preferred reinforcer only when neither of the more highly preferred reinforcers were available in the final phase. These findings suggest that access to the more highly preferred reinforcers competed with the less preferred reinforcers.

Our findings (i.e., that card selection responses for LP reinforcers did not occur when free access to this reinforcer was restricted) failed to fully replicate the findings of Gutierrez et al. (2007) and suggested that discriminated LP mands were not completely established. However, we suggest that this may be a false negative finding and that the different preference levels of the reinforcers interfered with the identification of discriminated mands for the less preferred reinforcers. The practical implication of this finding is that when attempting to train or test for discriminated mands, failure to

control the relative preference of other reinforcers may mask the establishment and display of discriminated mands for less preferred reinforcers. These findings suggest that the critical component of contriving the EO during mand training (Sundberg, Loeb, Hale, & Eigenheer, 2002) should extend beyond deprivation of the reinforcer for the target mand, and also should involve restricting access to other potentially more preferred sources of reinforcement. Obviously, these findings should be considered preliminary until they are replicated with additional participants and in more natural settings.

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